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A Study of Intra-ASEAN Trade:
An analysis of its indicators, determinants and implications

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Abstract

A Study of Intra-ASEAN Trade: An analysis of its indicators, and implications

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This study aims to analyze the degree of intra-ASEAN trade to determine how high ASEAN's *de facto* regional trade integration is, in comparison to other regions – EU, NAFTA and Mercosur, using two methods. Firstly, this paper will use trade indicators such as trade share, trade intensity and regional introversion index to compare across regions. This method produced contradictory results. For trade share, ASEAN was lower than EU and NAFTA and higher than Mercosur. For trade intensity and regional introversion index, however, the results shown are opposite.

As the first method produced contradictory results, a second method involving a gravity model was conducted. This method showed that ASEAN has a smaller impact on intra-regional trade than the standard FTA. EU was also found to be more integrated in terms of trade than ASEAN. The dummies for NAFTA and Mercosur were both statistically insignificant, suggesting no effect on trade beyond the standard FTA.

To explain why ASEAN has a limited regional trade integration despite tariff reductions, this paper identifies that both the Most Favored

Nation (MFN) applied tariff and ASEAN's preferential tariffs on its six FTA partners have reduced concurrently with the reduction in preferential tariffs toward ASEAN. As such, there is less incentive for ASEAN exporters trade within the block than outside the block.

Keywords: Intra-ASEAN Trade, Intra-Regional Trade, Regional Organizations, ASEAN

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List of Abbreviations

AANZFTA	ASEAN-Australia-New Zealand Free Trade Agreement
ACFTA	ASEAN-China Free Trade Agreement
AEC	ASEAN Economic Community
AFTA	ASEAN Free Trade Area
AIFTA	ASEAN-India Free Trade Agreement
AJCEP	ASEAN-Japan Comprehensive Economic Partnership
AKFTA	ASEAN-Korea Free Trade Agreement
ASEAN	Association of Southeast Asia Nations
ASEAN6	Group of Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand
CEPII	French Centre d'Etudes Prospectives et d'Informations Internationales
CEPT	Common Effective Preferential Tariff
CLMV	Group of Cambodia, Laos, Myanmar and Vietnam
COMESA	Common Market for Eastern and Southern Africa
CPTPP	Comprehensive and Progressive Trans-Pacific Partnership
EAC	East African Community
ECOWAS	Economic Community of West African States
EU	European Union
FTA	Free Trade Agreement
GDP	Gross Domestic Product
HE	Homogenous extra-regional trade intensity
HI	Homogenous intra-regional trade intensity

HS	Harmonized System
IMF	International Monetary Fund
MFN	Most Favoured Nation
MOP	Margin of Preference
NAFTA	North Atlantic Free Trade Agreement
NTM	Non-Tariff Measure
OLS	Ordinary Least Squares
PRF	Preferential
RCEP	Regional Comprehensive Economic Partnership
SADC	Southern African Development Community
SAARC	South Asian Association for Regional Cooperation
TRAINS	Trade Analysis Information System
UNCOMTRADE	United Nations International Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

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Chapter 1. Introduction

The Association of Southeast Asian Nations (ASEAN) comprises ten countries in Southeast Asia, including Brunei, Cambodia, Laos, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. Founded in 1967, ASEAN was intended to unite countries with diverse cultural backgrounds and historical animosities against the Communist threat that was prevalent in that period. The five founding members were Indonesia, Malaysia, Philippines, Singapore and Thailand. Another five Southeast Asian countries joined later – Brunei in 1984, Vietnam in 1995, Laos and Myanmar in 1997, and Cambodia in 1999. The five founding members and Brunei are often referred to as ASEAN6, while the remaining four members are often referred to as CLMV.

ASEAN has since evolved as a regional organization, particularly in terms of trade. In 1992, the ASEAN Free Trade Agreement (AFTA) was signed, outlining a timeframe for the elimination of tariffs and non-tariff barriers within 15 years from January 1994. The completion date was initially set at 2008, but was later brought forward to 2002 following the financial crisis in 1997. Under the Common Effective Preferential Tariffs (CEPT) framework in the AFTA, manufactured goods, agricultural products and services are covered, with lower tariff rates than the Most

Favored Nation (MFN) tariffs in the World Trade Organization (WTO) (Kien and Hashimoto, 2005).

As shown in Figure 1, preferential (PRF) tariff levels have reduced since 2000, with some ASEAN members, such as Singapore (Figure 1.7), completely eliminating tariffs. A calculation of the simple average of ASEAN's PRF tariffs in Figure 1.1 shows a marked reduction. In particular, it is significant that there has been a distinct decline in tariffs for both ASEAN6 and CLMV countries. Although CLMV countries joined ASEAN and AFTA later and were thus on a different timeframe for the reduction of tariffs, they too have mostly fulfilled their CEPT tariff obligations as well.

Figure 1. PRF Tariff Rates in ASEAN countries (%)

Figure 1.1 Average ASEAN PRF Tariffs

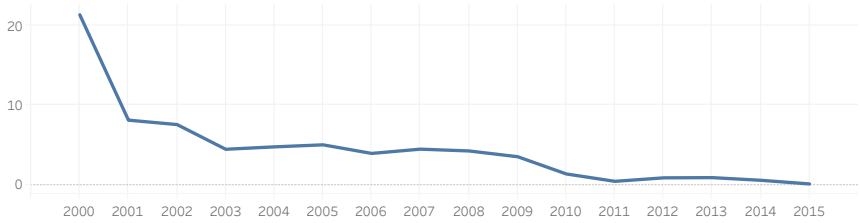


Figure 1.2 Brunei

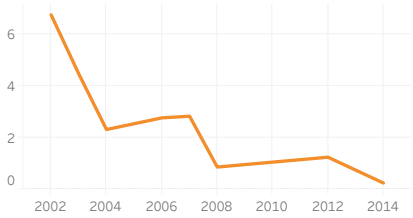


Figure 1.3 Cambodia

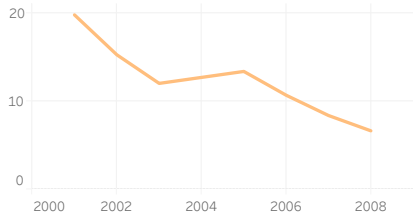


Figure 1.4 Indonesia

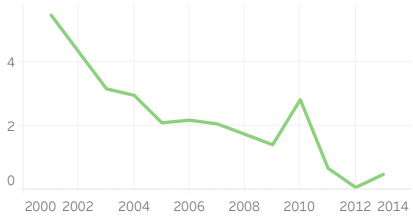


Figure 1.5 Malaysia

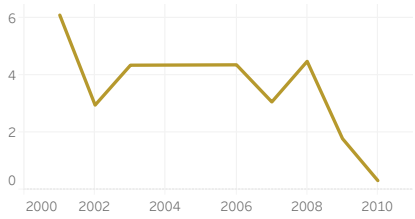


Figure 1.6 Philippines

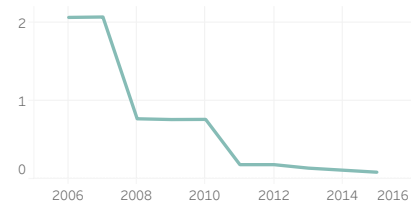


Figure 1.7 Singapore

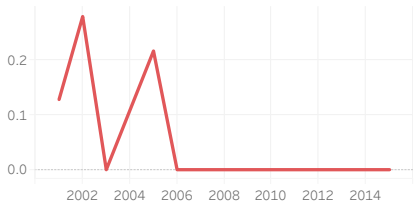


Figure 1.8 Thailand

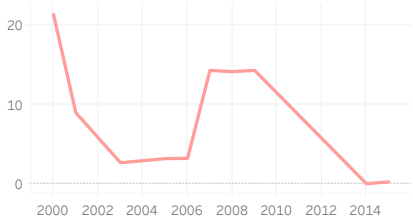
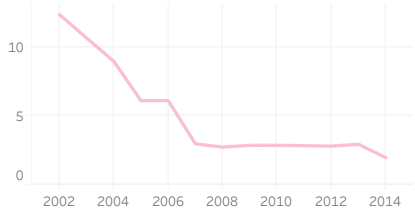


Figure 1.9 Vietnam



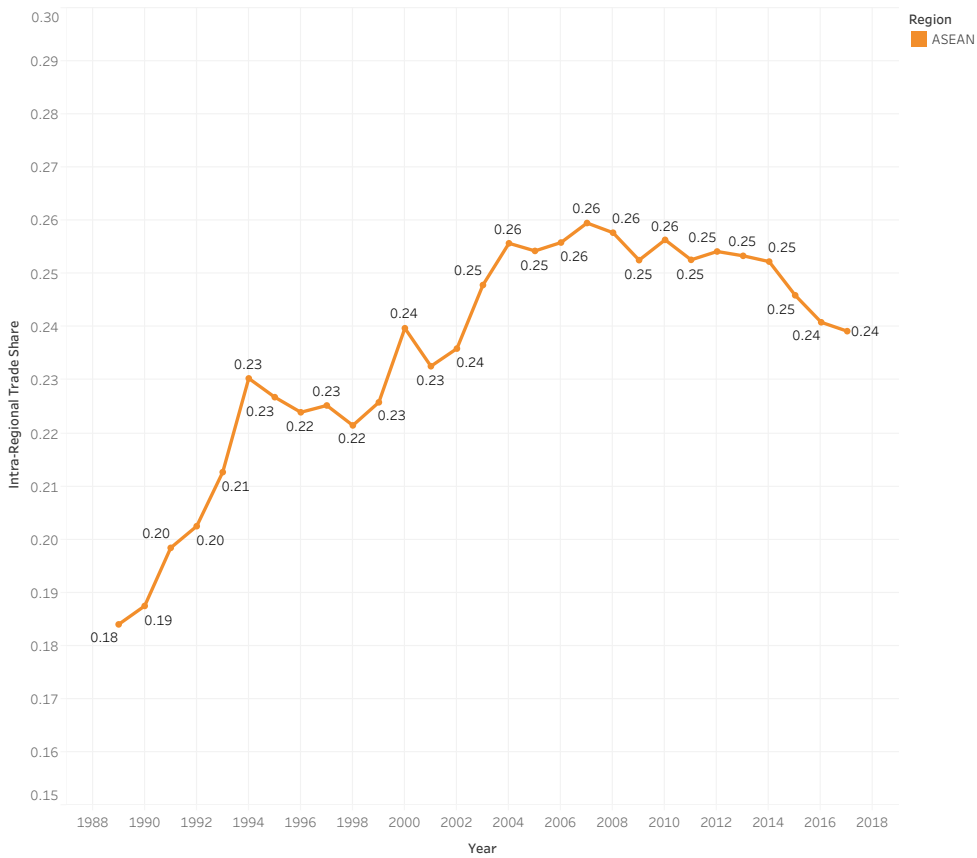
Source: UNCTAD TRAINS

In the light of the growing importance of regional trade to the ASEAN Economic Community, this paper questions how integrated ASEAN is in terms of regional trade. Even though the level of tariffs have declined under the CEPT starting from 1992, a glance at the share of intra-ASEAN trade across history (Figure 2) shows that it had only increased from 1988 to 1992, but not after that, staying at roughly a quarter of ASEAN's total trade. This could be viewed to show that "ASEAN economic integration has been a disappointment", especially in comparison to other regional organizations like European Union (EU), with an intra-regional trade share of 64% (Razak, 2018). Is intra-ASEAN trade really low? Why? This paper will consider indicators of intra-regional trade, including trade share, as well as adopt a gravity model approach to answer these questions.

The first section will cover existing literature on intra-regional trade and intra-ASEAN trade. It will look at the reasons currently provided for why intra-ASEAN trade is seemingly low, and consider if they are sufficient. In the second section, the paper will then use different indicators that measure the degree of intra-regional trade integration to determine if intra-ASEAN trade is high or low. This is done in comparison to other regional organizations like the EU for the European region, the North Atlantic Free Trade Agreement (NAFTA) for US, Canada and Mexico in

North America and Mercosur for five Latin American countries. Given the mixed results from this approach, the third section will use a gravity model estimation to evaluate the relative degree of intra-ASEAN trade. The final section will then provide other possible reasons for the level of intra-ASEAN trade through an analysis on the tariff rates.

Figure 2. Intra-ASEAN Trade Share, from 1988 to 2017



Source: UNCOMTRADE

Chapter 2. Literature Review

2.1. Intra-Regional Trade

There are many regional organizations in the world, ranging from a monetary union like the EU to a free trade area like ASEAN. Considering the regions of study in this paper based on the criteria of economic integration set by Hill and Menon (2010) in Table 1, EU is the most *de jure* economically integrated in terms of the current policies and institutions in place, followed by NAFTA. Although economic integration involves many different aspects, as seen in Table 1, this paper will focus only on the aspect of trade in goods.

Table 1. Indicators of Economic Integration

	EU	**NAFTA**	**ASEAN**	**Mercosur**	**CJK**
Free trade in goods	yes	yes	part	part	no
Free trade in services	yes	part	part	part	no
Capital mobility (FDI)	yes	part	part	part	no
Labour mobility	yes	no	no	no	no
Competition law converging	yes	no	no	no	no
Monetary union	yes	no	no	no	no
United fiscal policy	part	no	no	no	no

Source: Hill and Menon, 2010

Along with the formation of these regional organizations, regional trade agreements have also become more popular in recent years, from bilateral free trade agreements to large multi-country free trade agreements, such as the Comprehensive and Progressive Trans-Pacific Partnership

(CPTPP) as well as the Regional Comprehensive Economic Partnership (RCEP), with some ASEAN countries being members of both agreements.

Literature on intra-regional trade is diverse, with four main themes: (1) using indicators and measurements of intra-regional trade to determine the degree of integration; (2) identifying the determinants of trade integration or possible reasons for the low level of integration; (3) evaluating the impacts of intra-regional trade on the level of overall trade and economic development; and (4) determining the prospects of further economic integration. The next part of this section will look at existing literature for each theme.

2.1.1. Measurements and Indicators of Intra-Regional trade

To determine the degree of integration of a region, existing literature use different approaches. There are those who use gravity model regressions, ranging from standard Ordinary Least Squares (OLS) estimations (Elliott and Ikemoto, 2004; Thornton and Goglio, 2002; Hapsari and Mangunsong, 2006), Hausmann-Taylor estimations (Kien, 2009; Kien and Hashimoto, 2005), as well as stochastic frontier models (Armstrong, 2007; Armstrong et al, 2008; Miankhel et al, 2009; Trung et al, 2018). There are also those that introduce different measures and indicators, such as Hamanaka (2012, 2015) with three intra-regional trade

indicators and Belke and Wang (2006) introducing value-added based openness measures as alternatives to the standard trade openness index.

2.1.2. Identifying the Determinants of Trade Integration

Another common theme in literature explores the determinants of trade integration. Some studies take a broad overview to understand the determinants of trade integration, such as Trivic and Climczak (2012) that studies the intra-regional trade integration of the Western Balkans, Ouma (2017) that studies the determinants of agricultural exports in the East African Community (EAC), an International Monetary Fund (IMF) report (2017) that analyzes the regional integration of the Latin America and Carribean region, or Jeong (2013) that looks at the Common Market for Eastern and Southern Africa (COMESA).

Another group of studies identify the impact of specific countries on intra-regional integration, from observer states like those in South Asian Association for Regional Cooperation (SAARC) (De Silva and Lee, 2017) to specific large members like Brazil in Mercosur (Sosa and Adler, 2012) or South Africa in the Southern African Development Community (SADC) (Cassim, 2001). Other studies look at the impact on intra-regional trade of certain key changes in institutional structures, such as external initiatives like the Belt and Road Initiative on the EAC (Yoon, 2018), or internal

structural shifts like the currency union in Economic Community of West African States (ECOWAS) (Anokye and Chaudhry, 2014).

Other studies start with the premise that intra-regional trade integration has been low, and then later identify possible reasons for this. Some reasons identified for SAARC include the impact of intra-state and inter-state conflict (Batra, 2013), as well as the lack of basic transport connectivity, lack of technical harmonization and the presence of non-tariff barriers (Chaturvedi et al, 2017).

2.1.3. Impact on Trade and Economic Development

Besides the causes of intra-regional trade, its impacts are also widely studied in literature, focusing on two aspects: firstly, the impact of intra-regional trade on overall trade; secondly, the impact of intra-regional trade on economic development.

It is debatable whether regional trade agreements have been beneficial to trade. Krugman (1991) introduced the idea of the 'natural trading block', suggesting that trade within this block would be more efficient and welfare-increasing due to the geographical proximity. This positive effect is termed 'trade creation'. Yet, Krugman (1991) also points out that if such a block encourages a regional bias in trade patterns that causes a shift from trade with a more efficient partner outside the block to

trade with a less efficient partner within the block, then trade diversion occurs. As such, while trade creation is beneficial for countries, trade diversion is arguably not (Elliot and Ikemoto, 2004). An example of a study that evaluates the trade creating or diverting effects of a particular regional organization is Shaul Hamid and Aslam (2017). The authors show that there are trade diverting effects in a number of products and categories for ASEAN's clothing industry, which might disrupt ASEAN's vision of becoming a regional hub for the textile and clothing industry.

Besides the impact on overall trade, the impact on economic development has also been widely studied. Studies on the impact on general economic growth include Sebahazi (2012) that explores how the EAC can enhance the trade of landlocked countries in Africa, Miron et al (2010) that looks at how intra-regional trade in EU has encouraged sustainable economic development in Romania, and Rodriguez-Delgado (2007) that studies how the South Asia Free Trade Agreement has impacted regional trade flows and customs duties. Other studies consider the economic impact on specific sectors, from the agricultural sector in COMESA (Elbushra et al, 2010), to the manufacturing sector in Mercosur (Lee, 2003), and ECOWAS's impact on the major sectors of the Nigerian economy (Oguanobi et al, 2013).

2.1.4 Prospects of Further Economic Integration

A final theme looks at the prospects of future economic integration for specific regions. Some examples include Kim and Lee (2003)'s study of the prospects of a Northeast Asian free trade agreement (FTA), Handijski (2010)'s study of the possibility that Southeast Europe countries will join EU given the current trade policies in place, as well as Rohlfing-Dijoux (2017) who explores the prospects of developing intra-regional trade exchanges in the Indian Ocean region.

2.2. Intra-ASEAN Trade

As mentioned in the introduction, ASEAN has been shifting towards closer regional economic integration, first with the AFTA and more recently with the ASEAN Economic Community, with efforts to build a single production base across the region, harmonize tariffs and rules of origin, as well as focus on ASEAN centrality for the negotiation of regional agreements like the RCEP. In addition, ASEAN's development has all along been more export-oriented, with individual countries "competing for outsourced tasks from advanced economies" (Chen et al, 2017). By encouraging intra-ASEAN trade, ASEAN can be less dependent on extra-ASEAN countries, and instead build more intra-regional economic interdependence within ASEAN. This section will look at existing

literature that (a) examines the degree of intra-ASEAN trade integration and (b) explores the nature of intra-ASEAN trade.

2.2.1. Existing Approaches

Various studies specific to intra-ASEAN trade have analyzed the level of intra-ASEAN trade and provided possible explanations for the seemingly low level of intra-ASEAN trade despite the general decline in tariffs. These studies tend to fall into two categories: (1) trade indicators, or (2) gravity model approach.

The first type tends to use intra-regional trade indicators for comparisons across regional organizations (Ra, 2015a; Ra, 2015b; Ra, 2015c; Widodo, 2009; Chen et al, 2017). The indicators that appear often in literature are intra-regional trade share, intra-regional trade intensity and regional introversion index. Such studies tend to conclude that intra-ASEAN trade is low, especially in comparison to regional organizations like EU and NAFTA.

On the other hand, studies using the gravity model approach tend to conclude that ASEAN is trading more within the region than expected (Armstrong, 2007; Armstrong et al, 2008; Miankhel et al, 2009; Kien, 2009; Trung et al, 2018; Thornton and Goglio, 2002). These studies either use a standard OLS regression method with some modifications or a stochastic

frontier method for the gravity model. While the former OLS method is largely used to compare against other regions by including each region as a dummy variable (Kien and Hashimoto, 2005; Thornton and Goglio, 2002; Kien, 2009), the latter stochastic frontier method seeks to estimate the maximum possible levels of trade that might be achieved in the case of the most open and frictionless trade possible given current trade, transport and institutional technologies or practices (Armstrong, 2007). In so doing, such studies compare the actual trade performance compared to the trade potential, thereby evaluating the level of trade efficiency to determine the extent to which countries are currently fulfilling their trade potential.

2.2.2. Nature of Intra-ASEAN trade

To explain the degree of intra-ASEAN trade integration, three characteristics of intra-ASEAN trade are often mentioned. These characteristics are: the prevalence of intra-industry trade, the rise in non-tariff measures, and the region's significance as a node in global value chains. This section will analyze each characteristic in detail to see if the explanations hold water.

Intra-ASEAN trade tends to be dominated by intra-industry trade, while trade with non-ASEAN member countries is instead dominated by inter-industry trade. Widodo (2009) explains that the former is dominated

by “South-South” trade, given that most ASEAN countries are in similar stages of development, while the latter is dominated by “North-South” trade, i.e. with ASEAN’s main export partners like Japan, EU and the US that are developed countries.

The importance of intra-industry trade to the level of total trade in ASEAN is often used as an explanation for intra-ASEAN trade levels. For example, Hapsari and Mangunsong (2006) argue that their gravity model regression shows a positive coefficient on the similarity index[1]. This thereby suggests that the similar structure of export between ASEAN members has had a positive effect on bilateral exports, and that intra-industry trade may be expected to increase intra-regional trade (Hapsari and Mangunsong, 2006). Similarly, Menon (1996) used the Grubel-Lloyd Index[2] to show that growth in intra-industry trade has contributed more to growth in total trade than net trade. This is in line with the Linder Hypothesis, which states that the more similar the consumption patterns of countries, the more they will trade with one another. However, high levels of intra-industry trade does not necessarily lead to greater levels of intra-regional trade integration. The level of inter-industry trade is also important

[1] The Similarity Index uses the formula: Similarity Index = $100*\Sigma\min(Exports_{si}, Exports_{sk})$. This index measures how similar two countries’ export structures are.
[2] The Grubel-Lloyd Index uses the formula $GL_i = IIT_i/TT_i$, where $IIT_i=(X_i+M_i)-|X_i-M_i|$ and $TT_i=X_i+M_i$

in determining intra-regional trade levels. As such, intra-industry trade is insufficient to understand intra-regional trade.

On the other hand, explanations for why intra-ASEAN trade has remained low despite the reduction of tariffs include the concurrent increase in non-tariff measures (NTMs) (Ing et al, 2016; Ra, 2015c). The costs imposed by these NTMs can be decomposed into three categories: enforcement costs, sourcing costs and process-adaptation costs. The first, enforcement costs, relates to the cost that exporting companies must incur to show compliance to the NTMs. The second, sourcing costs, is generated by the "switch from low-grade intermediate sources to high-grade ones in order to meet NTM standards". Finally, the third, process-adaptation costs, involve the cost incurred in changing capital equipment to meet NTM standards (Ing et al, 2016). These additional costs from the increase in the number of NTMs offset the benefits gained from the tariff reductions, thereby hindering further integration of intra-ASEAN trade.

However, these NTMs are set on products for specific purposes, such as sanitary and phytosanitary measures for health or environmental concerns, rather than on specific countries. As a result, these NTMs are not intended to discriminate between countries or regions, thereby affecting trading partners both within and outside ASEAN equally for the same

product. It does not necessarily explain why intra-ASEAN trade has remained at the same level vis-à-vis overall ASEAN trade.

Finally, ASEAN is a well-connected node in the global value chain, with ASEAN countries dependent on extra-regional countries for crucial inputs for production and as an export destination of the intermediate goods that it produces (Esuivias Padilla et al, 2017; Hill and Menon, 2010). This, however, impacts intra-ASEAN trade because the source of imports and destination of exports thus lie outside the region rather than within. Among the three characteristics, this is the only one that seems to have some explanatory power for the degree of intra-ASEAN trade integration.

There are two ways in which this explains the seemingly low intra-ASEAN trade. Firstly, ASEAN has yet to become the single production base that it desires to be as set out in the ASEAN Economic Community blueprints. For exports, ASEAN tends to export intermediate inputs and raw materials with relatively low value-added (33% of gross exports) to extra-ASEAN countries as part of the larger global value chain, rather than final products (30% of gross exports). As for imports, ASEAN countries are highly dependent on imported parts and components from outside the region to produce its exports, which have approximately 35% of foreign value-added, out of which 78% come from extra-ASEAN countries. Unlike other regions like EU or NAFTA that are more regionally integrated and

thus supply and produce together, ASEAN has yet to become a single production base, and has the potential to better build intra-regional networks and supply chains to add value to resources within the region before exporting (Esuivias Padilla et al, 2017).

Secondly, its close trade relations to East Asia as part of the regional supply chain has led to the regional integration of ASEAN+3 with China, Japan and Korea, rather than intra-ASEAN trade per se. East Asia is the main export destination for ASEAN products with 38% of ASEAN exports heading to East Asia, compared to less than 20% within ASEAN. East Asia was also the largest recipient of GDP and domestic content of ASEAN exports, and this is an increasing trend (Esuivias Padilla et al, 2017). ASEAN also imports intermediate inputs from East Asia, with 10% of ASEAN's gross exports having foreign content from East Asia (Esuivias Padilla et al, 2017). In addition, Esuivias Padilla et al (2017) found that ASEAN is a significant part of vertical specialization and fragmented trade networks. This thus seems to suggest that ASEAN+3 (the ten ASEAN member states, as well as China, Japan and Korea) may be more economically integrated in terms of trade than the ten ASEAN member states per se. Such close integration can be explained by the importance of distance as a factor, and the larger regional growth of Asia driving the demand for ASEAN's intermediate inputs (Esuivias Padilla et al, 2017).

Chapter 3. Methodology and Analysis

The contrasting conclusions on the level of intra-ASEAN trade integration using indicators and gravity model approaches in literature present some simple, but interesting questions: Is intra-ASEAN trade integration high or low? What are possible reasons for the degree of intra-ASEAN trade integration? The first part will introduce the intra-regional trade indicators and compare ASEAN against the other regional organizations. The second part will use a gravity model to estimate the level of intra-ASEAN trade compared to its expected level, but will use an ordinary least squares method, rather than the stochastic frontier method.

Although the three characteristics of intra-ASEAN trade presented in the previous section have been used in literature to explain the level of intra-ASEAN trade integration, this paper concludes that only the third characteristic - ASEAN's significance as a node in the global value chain - provides a possible explanation for why intra-ASEAN trade share remains low, in comparison to overall ASEAN trade. The third part will consider other possible reasons for the level of intra-ASEAN trade, particularly analysing tariff data, since tariff reductions under the CEPT were a key factor that changed with the signing of the AFTA.

The trade data used in this paper was obtained from the United Nations International Trade Statistics Database (UNCOMTRADE) for the

years between 1988 and 2017, in the Harmonized System (HS) 2-digit codes. Data for variables used in the gravity model, such as distance, Gross Domestic Product (GDP) and population, were obtained from French Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) database. Tariff data was obtained from the Trade Analysis Information System (TRAINS) by the United Nations Conference on Trade and Development (UNCTAD).

3.1. Intra-Regional Trade Indicators

There are three indicators widely covered in literature (Hamanaka, 2012; Hamanaka, 2015; Ra, 2015; Ng and Yeats, 2003; Widodo, 2009). In essence, these indicators set out different benchmarks of comparison for the volume of intra-regional trade so that it may be comparable across regions. While intra-regional trade share compares against its total volume of trade, intra-regional trade intensity uses the region's significance in world trade and the regional introversion index uses the region's extra-regional trade as benchmarks for comparison across regions.

3.1.1. Intra-Regional Trade Share

Intra-regional trade share is the total volume of trade within the region as a fraction of the region's trade with the world. The equation is as follows:

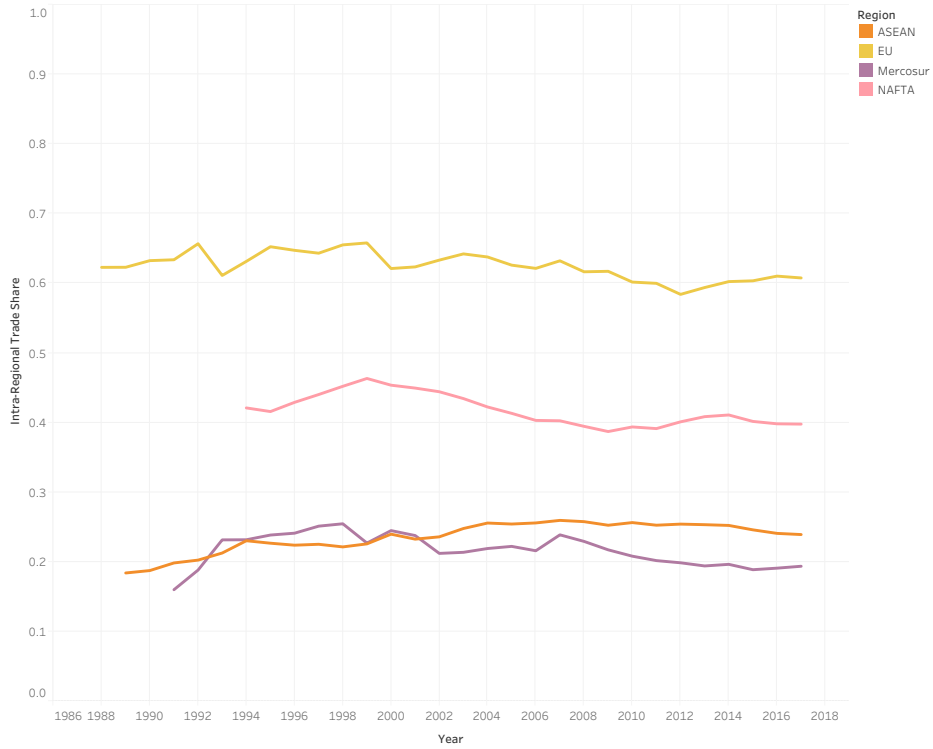
$$\text{Share}_{r,t} = \frac{\text{Exports}_{r,r,t} + \text{Imports}_{r,r,t}}{\text{Exports}_{r,W,t} + \text{Imports}_{r,W,t}} \quad \text{----- (1)}$$

$$t: \text{year};\ r: \text{region};\ W: \text{world}$$

It is commonly used as an indicator of intra-regional trade because it is easy to understand. However, there is no fixed benchmark for comparison as to whether the level of intra-regional trade is high and low (Hamanaka, 2015). Rather, it is often used in comparison to the intra-regional trade share of other regions.

As seen in Figure 3, intra-ASEAN trade share is 0.239 in 2017, far lower than that of EU (0.608) or NAFTA (0.398). However, ASEAN's trade share is comparable to that of Mercosur (0.194), which is of a similar stage of economic development and *de jure* economic integration as in Table 1, suggesting that ASEAN's trade share is not that low for an emerging market region.

Figure 3. Intra-Regional Trade Share



Source: UNCOMTRADE

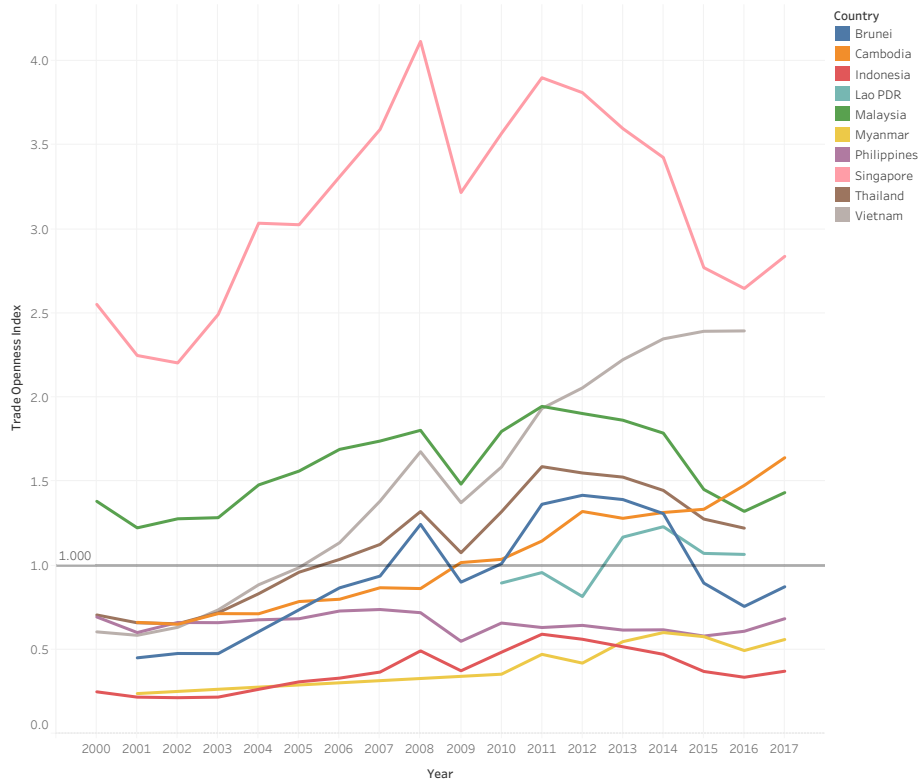
Taking a closer look at the equation for intra-regional trade share, there are two ways for the values to be high: (1) intra-regional trade volume (numerator) can be high, or (2) the region's volume of trade with the world (denominator) can be low. For intra-regional trade share to be a good reflection of intra-regional trade integration, the denominator has to be high. Using the trade openness index, which is the total volume of trade as a fraction of GDP, trade volume is determined to be high if above the value

of one i.e. the country is trading more than expected given its GDP. The equation of the trade openness index is:

$$\text{Trade Openness Index}_{r,t} = \frac{\text{Exports}_{r,t}+\text{Imports}_{r,t}}{\text{GDP}_{r,t}} \text{-----(2)}$$

As seen in Figure 4, in general, most ASEAN countries have a high trade openness index, especially Singapore and in recent years, Vietnam, suggesting that ASEAN countries rely on external trade, rather than domestic consumption and production. As a result, given that the region's trade openness is high, intra-ASEAN trade share can be determined to reflect intra-regional trade volume.

Figure 4. Trade Openness Index



Source: UNCOMTRADE

3.1.2. Intra-Regional Trade Intensity

A similar intra-regional trade indicator that takes into account the region's trade volume is the intra-regional trade intensity. By taking the intra-regional trade share as a fraction of the region's significance in world trade (Hamanaka, 2015), the equation is as follows:

$$\text{Intensity}_{r,t} = \frac{\text{Share}_{r,t}}{\frac{\text{Exports}_{r,W,t}+\text{Imports}_{r,W,t}}{\text{Exports}_{W,t}+\text{Imports}_{W,t}}} \text{ -----(3)}$$

A similar indicator is the homogenous intra-regional trade intensity, which is the intra-regional trade share as a fraction of the region's extra-regional trade as a share of the trade volume of the world excluding the region (Hamanaka, 2015). The equation is as follows:

$$\mathrm{HI}_{r,t} = \text{Homo IntraReg Intensity}_{r,t} = \frac{\mathrm{Share}_{r,t}}{\frac{\mathrm{Exports}_{r,W-r,t}+\mathrm{Imports}_{r,W-r,t}}{\mathrm{Exports}_{W-r,t}+\mathrm{Imports}_{W-r,t}}} \text{ -----(4)}$$

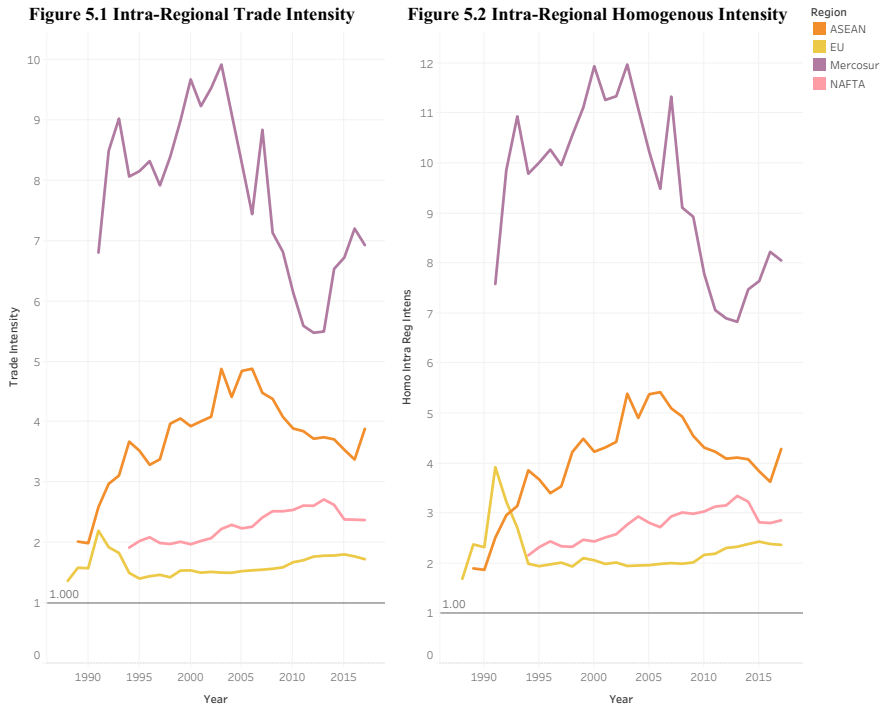
Both indicators have a threshold of one. A value higher than one suggests that the region is trading within the region more than the region's significance in world trade, while a value lower than one suggests the opposite.

As shown in Figure 5.1, all four regions have intra-regional trade intensity above the threshold of one. This means that all four regions are trading more within the region than outside the region. Comparing across regions, ASEAN has a lower intra-regional trade intensity compared to Mercosur, but higher vis-à-vis EU and NAFTA. A similar result can be seen for the homogenous intra-regional trade intensity in Figure 5.2.

This result is the opposite of Figure 3. This inversed result can be explained mathematically by how Mercosur's share of world trade is far lower than the other regions, resulting in a smaller denominator in equation (4). As a result, Mercosur's trade is more intense than ASEAN, even though

ASEAN's share of world trade is also lower than the more developed regions of EU and NAFTA.

Figure 5. Intra-Regional Trade Intensity



Source: UNCOMTRADE

However, intra-regional trade intensity as an indicator for intra-regional trade integration presents three problems. The first problem is the giant problem, which occurs when the region is large, as all four regions in this paper are, which leads the benchmark against the world to be diluted because changes in the region would invariably lead to changes in the world

benchmark as well (Hamanaka, 2015). The second problem is its range variability, meaning that the indicator makes for good comparison for a common partner but not across different regions. This thus makes it a difficult instrument for comparison across regions in this paper. Finally, this indicator also has a range asymmetry issue, where most regions tend to be above the threshold compared to below. This can be seen in Figure 5, where all four regions are above the threshold of one (Hamanaka, 2015).

3.1.3. Regional Introversion Index

The Regional Introversion Index uses the homogenous intra-regional trade intensity (HI) in equation (4) and the homogenous extra-regional trade intensity (HE) in equation (5) and compares the two values to see if intra-regional trade is more introverted to within the region or extroverted to outside the region. The equations are as follows:

$$\mathrm{HE}_{r,t} = \text{Homo ExtraReg Intensity}_{r,t} = \frac{1-\mathrm{Share}_{r,t}}{1-\frac{\mathrm{Exports}_{r,W-r,t}+\mathrm{Imports}_{r,W-r,t}}{\mathrm{Exports}_{W-r,t}+\mathrm{Imports}_{W-r,t}}} \text{ ----(5)}$$

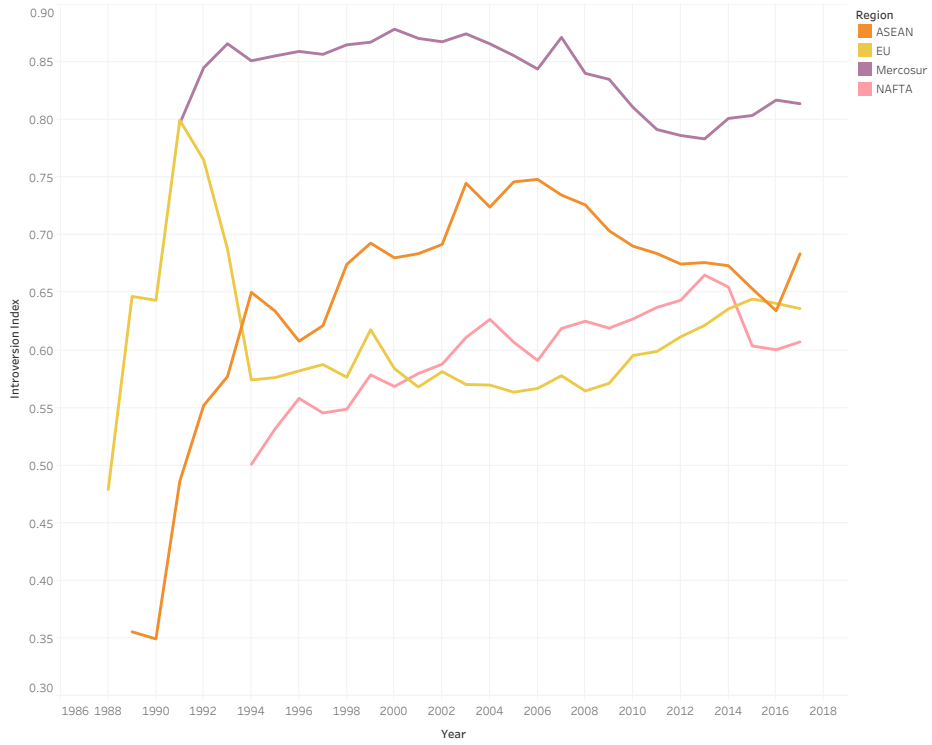
$$\text{Introversion}_{r,t} = \frac{\mathrm{HI}_{r,t}-\mathrm{HE}_{r,t}}{\mathrm{HI}_{r,t}+\mathrm{HE}_{r,t}} \text{ -----(6)}$$

The threshold value is for the regional introversion index is zero. A value above zero suggests that the homogenous intra-regional trade

intensity (HI) is higher than extra-regional trade intensity (HE), meaning that the region trades more internally than externally. On the other hand, a value below zero can then be inferred to mean that HI is lower than HE, suggesting that the region trades more externally than internally (Hamanaka, 2015).

Figure 6 shows that all four regions have index values above the threshold of zero, meaning that they are indeed trading more internally than externally. However, compared to other regions, ASEAN's Regional Introversion Index is once again in the middle. Similar to intra-regional trade intensity, ASEAN's regional introversion index value is sandwiched between Mercosur with a higher index value and NAFTA and EU with a lower value.

Figure 6. Regional Introversion Index



Source: UNCOMTRADE

3.1.4. Discussion

In summary, the three intra-regional indicators use different standards of comparison among ASEAN and the three other regions of interest, but the results found are contradictory. ASEAN's trade share is lower than larger regions like EU and NAFTA, but is higher than emerging region Mercosur, which is arguably a better candidate for comparison because Mercosur and ASEAN have similar economic development levels. Yet, when each region's significance in world trade is taken into account in

intra-regional trade intensity and regional introversion indices, ASEAN seems to have a lower level of trade integration than Mercosur, but higher than EU and NAFTA. These results present an unclear picture as to ASEAN's standing in terms of intra-regional trade, vis-à-vis the other three regions of interest.

3.2. Gravity Model

To get a clearer conclusion on the degree of intra-ASEAN trade compared to the other three regions EU, NAFTA and Mercosur, this section uses a gravity model approach, first adopting a standard OLS model, followed by two regressions with fixed effects, first on importer and exporter, and then later on importer-time and exporter-time.

Panel data with 394,338 observations was used, with data for the volume of exports obtained from UNCOMTRADE across all countries and all available years from 1988 to 2017. Standard gravity model variables data such as GDP and population statistics were obtained from CEPII. $LANG_{i,j}$ is a dummy variable that takes the value of one for common language and zero otherwise, while $FTA_{i,j,t}$ is a dummy variable that takes the value of one if there is an FTA in place between the two countries and zero otherwise.

To investigate the effects of ASEAN as a regional organization beyond the standard FTA effects, $ASEAN_{i,j}$ was added as a dummy variable that takes the value of one when both importing and exporting countries are ASEAN member states and zero otherwise. $ASEAN_{i,j}$ was later substituted for $EU_{i,j,}$ $NAFTA_{i,j,}$ and $MERC_{i,j}$ one by one so as to compare and analyze each regional organization's impact on trade vis-à-vis ASEAN. Gravity models combining these four regional dummies with the FTA dummy, as well as one without the FTA dummy were also analyzed. To check for robustness, two checks were done, first limiting the time period to year 2000 to 2017, and second testing for White heteroskedasticity. This gravity model does not include the level of tariffs as a variable.

3.2.1. Gravity Model with FTA dummy

The first gravity model equation is as follows:

$$\log EXPORTS_{i,j,t} = \beta_0 + \beta_1 \log GDP_{i,t} + \beta_2 \log GDP_{j,t} + \beta_3 \log DIST_{i,j} +$$

$$\beta_4 \log POP_{i,t} + \beta_5 \log POP_{j,t} + \beta_6 LANG_{i,j} + \beta_7 FTA_{i,j,t} + u_{i,j,t} \text{-----(7)}$$

The regression results for the gravity model in (7) are presented in Table 2, which shows the expected results from a gravity model as presented by Tinbergen (1962), with positive coefficients for exporter and importer GDP and populations, a negative coefficient for distance, as well

as positive coefficients for common language and FTA dummies. All coefficients were shown to be significant at 1% significance level.

Table 2. General gravity model results

	(a) OLS	(b) FE for exporter and importer	(c) FE for exporter-time and importer-time
$constant_{ijt}$	-28.93*** (0.091)	-5.24*** (0.18)	22.84*** (0.049)
$logGDP_{it}$	1.14*** (0.0026)	0.56*** (0.012)	
$logGDP_{jt}$	0.79*** (0.0024)	0.55*** (0.011)	
$logDIST_{ijt}$	-1.30*** (0.0055)	-1.73*** (0.0055)	-1.74*** (0.0055)
$logPOP_{it}$	0.069*** (0.0030)	0.27*** (0.040)	
$logPOP_{jt}$	0.039*** (0.0029)	0.079** (0.035)	
$LANG_{ij}$	0.91*** (0.011)	0.91*** (0.011)	0.92*** (0.011)
FTA_{ijt}	0.75*** (0.013)	0.51*** (0.012)	0.51*** (0.012)
Observations	394338	394338	394338
R-squared	0.610	0.725	0.743

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

3.2.2. Gravity Model with individual regions' dummies

To investigate the effects of ASEAN, the dummy $ASEAN_{i,j}$ was added. The second gravity model equation is thus as follows:

$$\log EXPORTS_{i,j,t} = \beta_0 + \beta_1 \log GDP_{i,t} + \beta_2 \log GDP_{j,t} + \beta_3 \log DIST_{i,j} + \beta_4 \log POP_{i,t} + \beta_5 \log POP_{j,t} + \beta_6 LANG_{i,j} + \beta_7 FTA_{i,j,t} + \beta_8 ASEAN_{i,j} + u_{i,j,t} \text{----(8)}$$

The regression result for the gravity model in (8) are shown in (d)~(f) in Table 3. The gravity model in equations (7) and (8) show similar results in terms of the sign of the coefficients and their significance of the variables in the original gravity model. Of greatest concern is the ASEAN dummy variable, which shows a positive coefficient under the standard OLS estimation in (d), but negative coefficients in (e) and (f) when fixed effects for exporter and importer, as well as exporter-time and importer-time are taken into account respectively. This suggests that there might have been an omitted variable bias in the OLS regression in (d) that led to a positive bias on the ASEAN dummy variable. A possible omitted variable bias may be how specific countries like Malaysia, Thailand and Singapore tend to dominate intra-ASEAN trade. By taking into account the fixed effects on importers and exporters, as well as on importer-time and exporter-time, this positive bias is corrected in both (e) and (f), leading to an eventual negative coefficient.

By looking at (e) and (f) in Table 3, the coefficient of the ASEAN dummy is larger than that of the FTA dummy, such that the sum of the two dummies' coefficients are negative. This suggests that ASEAN countries are trading even less than non-FTA countries, reflecting limited intra-ASEAN trade integration.

To compare against other regional organizations in this study, equation (8) was repeated, substituting the ASEAN dummy with dummies of other regional organizations, $\mathrm{EU}_{i,j}$, $\mathrm{NAFTA}_{i,j}$, $\mathrm{MERC}_{i,j}$ for EU, NAFTA and Mercosur respectively. The results are shown in (g)~(o) in Tables 4 to 6.

Looking at the results in (h) and (i) for EU and (e) and (f) for ASEAN, both regional dummies are negative and larger than the FTA, suggesting counter-intuitively that both regions are trading less than even country pairs without an FTA. However, a comparison between the sum of the region dummy and FTA dummy for the two regions show that the sum of the coefficients of EU and FTA dummies is less negative than that of ASEAN and FTA dummies, suggesting that EU is more integrated than ASEAN in terms of trade in exports. In particular, the sum of the ASEAN and FTA dummies is (-0.41) in (e) and (-0.40) in regression (f) is more negative than the sum of EU and FTA dummies is (-0.24) in both (h) and

(i). This seems to suggest that intra-EU trade is more integrated that intra-ASEAN trade.

In contrast, the coefficients for both NAFTA and Mercosur regional dummies in (k), (l), (n) and (o) were statistically insignificant, suggesting that these two regional organizations had no impact beyond the standard FTA effect.

Table 3. Gravity model with ASEAN

	(d) OLS	(e) FE for exporter and importer	(f) FE for exporter-time and importer-time
$constant_{ijt}$	-29.03***	-5.08***	22.95***
	(0.091)	(0.181)	(0.049)
$logGDP_{it}$	1.14***	0.56***	
	(0.0026)	(0.012)	
$logGDP_{jt}$	0.80***	0.54***	
	(0.0024)	(0.011)	
$logDIST_{ijt}$	-1.30***	-1.74***	-1.75***
	(0.0055)	(0.0056)	(0.0055)
$logPOP_{it}$	0.066***	0.27***	
	(0.0030)	(0.040)	
$logPOP_{jt}$	0.037***	0.079**	
	(0.0029)	(0.035)	
$LANG_{ij}$	0.918***	0.90***	0.91***
	(0.011)	(0.012)	(0.011)
FTA_{ijt}	0.73***	0.53***	0.53***
	(0.013)	(0.012)	(0.055)
$ASEAN_{ij}$	1.09***	-0.94***	-0.93***
	(0.061)	(0.056)	(0.055)
Observations	394338	394338	394338
R-squared	0.611	0.725	0.743

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers indicated in () are standard errors; Source: UNCOMTRADE

Table 4. Gravity model with EU

	(g) OLS	(h) FE for exporter and importer	(i) FE for exporter-time and importer-time
$constant_{ijt}$	-28.89***	-4.56***	23.27***
	(0.091)	(0.18)	(0.050)
$logGDP_{it}$	1.14***	0.55***	
	(0.0026)	(0.012)	
$logGDP_{jt}$	0.79***	0.54***	
	(0.0025)	(0.011)	
$logDIST_{ijt}$	-1.29***	-1.78***	-1.78***
	(0.0056)	(0.0056)	(0.0056)
$logPOP_{it}$	0.071***	0.29***	
	(0.0030)	(0.040)	
$logPOP_{jt}$	0.042***	0.11***	
	(0.0029)	(0.034)	
$LANG_{ij}$	0.92***	0.89***	0.90***
	(0.011)	(0.011)	(0.011)
FTA_{ijt}	0.72***	0.61***	0.62***
	(0.014)	(0.012)	(0.013)
EU_{ij}	0.22***	-0.85***	-0.86***
	(0.091)	(0.022)	(0.021)
Observations	394338	394338	394338
R-squared	0.610	0.726	0.744

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers indicated in () are standard errors; Source: UNCOMTRADE

Table 5. Gravity model with NAFTA

	(j) OLS	(k) FE for exporter and importer	(l) FE for exporter-time and importer-time
$constant_{ijt}$	-28.9*** (0.091)	-5.24*** (0.18)	22.84*** (0.049)
$logGDP_{it}$	1.14*** (0.0026)	0.56*** (0.012)	
$logGDP_{jt}$	0.79*** (0.0024)	0.55*** (0.011)	
$logDIST_{ijt}$	-1.30*** (.0055)	-1.73*** (0.0055)	-1.74*** (0.0055)
$logPOP_{it}$	0.069*** (0.0030)	0.27*** (0.040)	
$logPOP_{jt}$	0.039*** (0.0029)	0.079** (0.035)	
$LANG_{ij}$	0.91*** (0.011)	0.91*** (0.011)	0.92*** (0.011)
FTA_{ijt}	0.75*** (0.013)	0.51*** (0.012)	0.51*** (0.012)
$NAFTA_{ij}$	0.33* (0.19)	-0.037 (0.16)	-0.046 (0.16)
Observations	394338	394338	394338
R-squared	0.610	0.725	0.743

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

Table 6. Gravity model with Mercosur

	(m) OLS	(n) FE for exporter and importer	(o) FE for exporter-time and importer-time
$constant_{ijt}$	-28.94**	-5.24***	22.84***
	(0.091)	(0.18)	(0.049)
$logGDP_{it}$	1.14***	0.56***	
	(0.026)	(0.012)	
$logGDP_{jt}$	0.79***	0.55***	
	(0.0024)	(0.011)	
$logDIST_{ijt}$	-1.30***	-1.73***	-1.74***
	(0.0055)	(0.0055)	(0.0055)
$logPOP_{it}$	0.068***	0.27***	
	(0.0030)	(0.040)	
$logPOP_{jt}$	0.0391***	0.079**	
	(0.0029)	(0.0035)	
$LANG_{ij}$	0.91***	0.91***	0.92***
	(0.011)	(0.011)	(0.011)
FTA_{ijt}	0.75***	0.51***	0.51***
	(0.013)	(0.012)	(0.012)
$MERC_{ij}$	1.29***	0.0077	0.048
	(0.14)	(0.012)	(0.12)
Observations	394338	394338	394338
R-squared	0.610	0.725	0.743

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

3.2.3. Gravity Model with combined regions' dummies

Another two gravity model equations were analyzed, one with the FTA dummy and the inclusion of the dummies of all four regional organizations in equation (9), and the other without the FTA dummy but including the dummies of all four regional organizations in equation (10). The results are in Table 7 and 8, with (p)~(r) for equation (9) and (s)~(t) for equation (10).

$$\log EXPORTS_{i,j,t} = \beta_0 + \beta_1 \log GDP_{i,t} + \beta_2 \log GDP_{j,t} + \beta_3 \log DIST_{i,j} + \beta_4 \log POP_{i,t} + \beta_5 \log POP_{j,t} + \beta_6 LANG_{i,j} + \beta_7 FTA_{i,j,t} + \beta_8 ASEAN_{i,j} + \beta_9 EU_{i,j} + \beta_{10} NAFTA_{i,j} + \beta_{11} MERC_{i,j} + u_{i,j,t} \text{----(9)}$$

$$\log EXPORTS_{i,j,t} = \beta_0 + \beta_1 \log GDP_{i,t} + \beta_2 \log GDP_{j,t} + \beta_3 \log DIST_{i,j} + \beta_4 \log POP_{i,t} + \beta_5 \log POP_{j,t} + \beta_6 LANG_{i,j} + \beta_7 ASEAN_{i,j} + \beta_8 EU_{i,j} + \beta_9 NAFTA_{i,j} + \beta_{10} MERC_{i,j} + u_{i,j,t} \text{----(10)}$$

Similar to the results shown in Table 3 to 6, (q), (r), (t) and (u) show a negative and statistically significant coefficient on the ASEAN and EU dummies. Similar to that in (k) and (l), the coefficient for NAFTA was statically significant, but the results for Mercosur differed slightly in (q) and (r) from that in (n) and (o) with negative coefficients that were statistically significant at 5% and 10% levels respectively.

Table 7. Combined gravity model

	(p) OLS	(q) FE for exporter and importer	(r) FE for exporter-time and importer-time
$constant_{ijt}$	-29.00***	-4.33***	23.42***
	(0.091)	(0.18)	(0.50)
$logGDP_{it}$	1.14***	0.55***	
	(0.0026)	(0.012)	
$logGDP_{jt}$	0.79***	0.54***	
	(0.0025)	(0.011)	
$logDIST_{ijt}$	-1.28***	-1.80***	-1.80***
	(0.0057)	(0.0057)	(0.0057)
$logPOP_{it}$	0.068***	0.29***	
	(0.0030)	(0.040)	
$logPOP_{jt}$	0.039***	0.11***	
	(0.0029)	(0.034)	
$LANG_{ij}$	0.93***	0.88***	0.89***
	(0.011)	(0.011)	(0.011)
FTA_{ijt}	0.68***	0.64***	0.66***
	(0.014)	(0.012)	(0.013)
$ASEAN_{ij}$	1.16***	-1.13***	-1.13***
	(0.061)	(0.056)	(0.055)
$NAFTA_{ij}$	0.43**	-0.24	-0.26
	(0.19)	(0.16)	(0.16)
EU_{ij}	0.27***	-0.89***	-0.91***
	(0.023)	(0.022)	(0.022)
$MERCOSUR_{ij}$	1.39***	-0.24**	-0.21*
	(0.14)	(0.12)	(0.12)
Observations	394338	394338	394338
R-squared	0.611	0.726	0.744

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

Table 8. Combined gravity model without FTA

	(s) OLS	(t) FE for exporter and importer	(u) FE for exporter-time and importer-time
$constant_{ijt}$	-28.93***	-5.03***	24.45***
	(0.091)	(0.18)	(0.046)
$logGDP_{it}$	1.16***	0.60***	
	(0.0026)	(0.012)	
$logGDP_{jt}$	0.81***	0.57***	
	(0.0024)	(0.011)	
$logDIST_{ijt}$	-1.39***	-1.91***	-1.91***
	(0.0052)	(0.0053)	(0.0052)
$logPOP_{it}$	0.051***	0.23***	
	(0.0030)	(0.040)	
$logPOP_{jt}$	0.018***	0.049	
	(0.0029)	(0.035)	
$LANG_{ij}$	0.98***	0.92***	0.93***
	(0.011)	(0.011)	(0.011)
FTA_{ijt}			
$ASEAN_{ij}$	1.56***	-0.76***	-0.75***
	(0.061)	(0.055)	(0.054)
$NAFTA_{ij}$	0.81***	0.12	0.11
	(0.19)	(0.16)	(0.16)
EU_{ij}	0.56***	-0.64***	-0.64***
	(0.022)	(0.021)	(0.021)
$MERCOSUR_{ij}$	1.76***	0.14	0.167
	(0.14)	(0.12)	(0.12)
Observations	394338	394338	394338
R-squared	0.608	0.724	0.742

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

3.2.4. Gravity Models with robustness checks

To check the robustness of the results in Table 3 (d)~(f), two different gravity models were run. The first model uses only the observations from year 2000 to 2017, rather than all the observations from year 1988 to 2017. This tests whether the results are reflective of intra-ASEAN trade integration even for a more recent period of time. The second model checks for White heteroskedastic standard errors. Heteroskedasticity affects the standard error of the coefficient, which could influence the significance of the result.

Table 6 presents the results of the two checks for robustness, with (v)~(x) for the first check that restricted the time period and (y)~(aa) for the test of heteroskedasticity. Similar to Table 3 (e)~(f), the coefficient on the ASEAN dummy remains negative and significant in both robustness checks, as seen from (w), (x), (z) and (aa). This suggests that the results for the ASEAN dummy presented in Table 3 are robust, even after taking into account a more recent time period and heteroskedastic standard errors.

Table 9. Time Period 2000-2017

	(v) OLS	(w) FE for exporter and importer	(x) FE for exporter-time and importer-time
$constant_{ijt}$	-23.31***	2.39***	30.21***
	(0.11)	(0.24)	(0.059)
$logGDP_{it}$	1.17***	0.51***	
	(0.0031)	(0.016)	
$logGDP_{jt}$	0.81***	0.57***	
	(0.0029)	(0.016)	
$logDIST_{ijt}$	-1.30***	-1.79***	-1.79***
	(0.0066)	(0.0067)	(0.0067)
$logPOP_{it}$	0.073***	0.21***	
	(0.0036)	(0.055)	
$logPOP_{jt}$	0.040***	0.30***	
	(0.0034)	(0.055)	
$LANG_{ij}$	0.93***	0.92***	0.92***
	(0.013)	(0.013)	(0.013)
FTA_{ijt}	0.87***	0.53***	0.53***
	(0.015)	(0.014)	(0.014)
$ASEAN_{ijt}$	0.86***	-1.03***	-1.06***
	(0.072)	(0.066)	(0.065)
Observations	293,905	293,905	293,905
R-square	0.614	0.727	0.739

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

Table 10. White Heteroskedasticity

	(y) OLS	(z) FE for exporter and importer	(aa) FE for exporter-time and importer-time
$constant_{ijt}$	-22.13*** (0.092)	1.82*** (0.19)	29.85*** (0.053)
$logGDP_{it}$	1.14*** (0.0026)	0.56*** (0.012)	
$logGDP_{jt}$	0.80*** (0.0025)	0.54*** (0.011)	
$logDIST_{ijt}$	-1.30*** (0.0054)	-1.74*** (0.0060)	-1.75*** (0.0060)
$logPOP_{it}$	0.066*** (0.0031)	0.27*** (0.044)	
$logPOP_{jt}$	0.037*** (0.0029)	0.79** (0.033)	
$LANG_{ij}$	0.92*** (0.011)	0.90*** (0.012)	0.91*** (0.011)
FTA_{ijt}	0.73*** (0.012)	0.53*** (0.012)	0.53*** (0.012)
$ASEAN_{ijt}$	1.09*** (0.056)	-0.94*** (0.047)	-0.93*** (0.046)
Observations	394,338	394,338	394,338
R-square	0.611	0.725	0.743

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level; Numbers in () are standard errors; Source: UNCOMTRADE

3.3. Possible Reasons for Intra-Regional Trade Integration

Having concluded from an analysis of intra-ASEAN trade indicators and the gravity model that intra-ASEAN trade is low, this section proposes that there are two possible reasons for the level of intra-ASEAN trade integration. Although intra-ASEAN tariffs have indeed reduced over the years under CEPT of AFTA, (a) ASEAN's MFN tariffs and (b) its PRF tariff rates for FTA partners have also reduced concurrently. As a result, there is less incentive to trade within the region, because the difference between intra-region and extra-region, whether general WTO members or its FTA partners, is small. This section will cover these two aspects: ASEAN's low MFN applied tariff rates and ASEAN's low PRF tariff rates on its six FTA partners.

3.3.1. ASEAN's MFN Tariffs

A possible reason for the relatively low increase in intra-ASEAN trade is that although tariffs within ASEAN have declined, there was a corresponding decline in the MFN tariffs applied by ASEAN. As a result, there is less incentive for ASEAN countries to trade within the region.

By calculating the average of the MFN and PRF tariffs on products being imported into each respective region, first weighed by the significance of each sector's imports using HS 2-digit code, and then

weighed by the significance of the country's imports, the difference in the two tariff rates were compared across the regions. The equations used are as follows:

$$MFN_{c,t} = \text{weighted average of MFN rates for country c in time t}$$

$$= \frac{\sum_S MFN_{s,t} \times Import_{s,t}}{\sum_s Import_{s,t}} \text{ -----(9)}$$

$$MFN_{r,t} = \text{weighted average of MFN rates for region r in time t}$$

$$= \frac{\sum_c MFN_{c,t} \times Import_{c,t}}{\sum_c Import_{c,t}} \text{ -----(10)}$$

$$PRF_{c,t} = \text{weighted average of PRF rates for country c in time t}$$

$$= \frac{\sum_S PRF_{s,t} \times Import_{s,t}}{\sum_s Import_{s,t}} \text{ -----(11)}$$

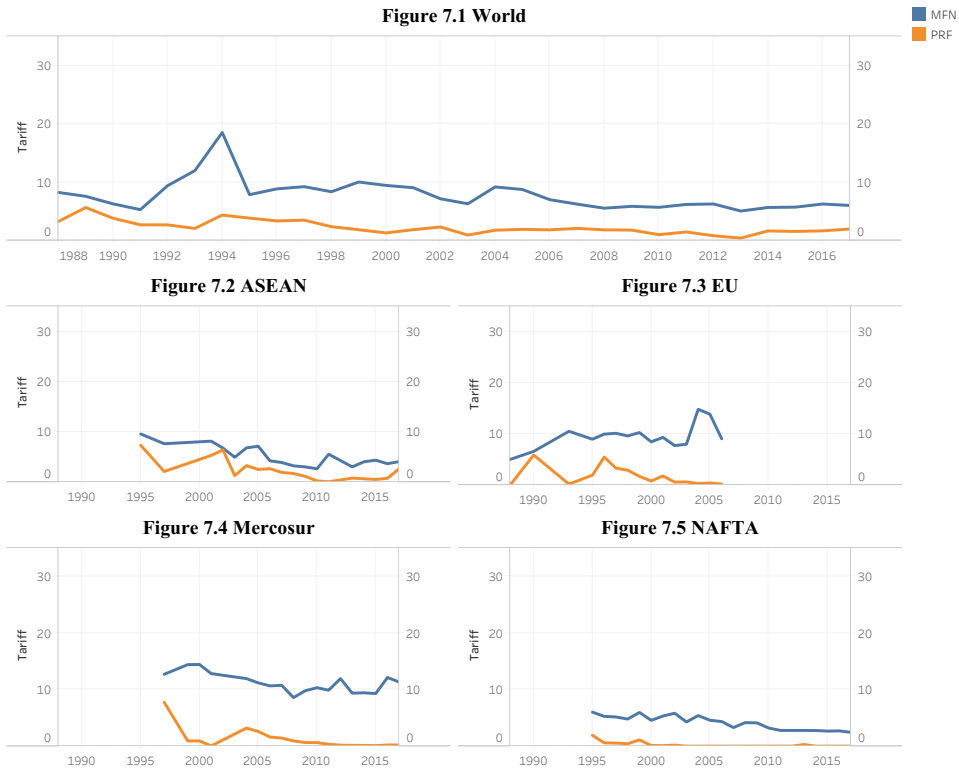
$$PRF_{r,t} = \text{weighted average of PRF rates for region r in time t}$$

$$= \frac{\sum_c PRF_{c,t} \times Import_{c,t}}{\sum_c Import_{c,t}} \text{-----(12)}$$

$$MOP_{r,t} = \text{margin of preference for region r in time t}$$

$$= MFN_{r,t} - PRF_{r,t} \text{-----(13)}$$

Figure 7. MFN and PRF Tariffs on Imports to ASEAN (%)



Source: UNCTAD TRAINS

Figure 7 shows a comparison of $MFN_{r,t}$ and $PRF_{r,t}$ of each region. The margin of preference (MOP), which is the difference between $MFN_{r,t}$ and $PRF_{r,t}$, for the ASEAN region in Figure 7.2 is smaller than the World average (Figure 7.1), EU (Figure 7.3) and NAFTA (Figure 7.5). This suggests that a possible reason for the low intra-regional trade in ASEAN, compared to EU and NAFTA is that the MOP is small, and thus there is less cost incentive for countries to trade within the region compared to

externally. The MOP for Mercosur in Figure 7.4 is large, which suggests that intra-regional trade share should be high, comparable to EU's. However, Mercosur's low intra-regional trade share suggests that there are other factors besides tariffs, like institutional factors, that could be hindering intra-regional trade.

Nevertheless, in comparison to EU and NAFTA, the small MOP for ASEAN could possibly be a reason for why ASEAN countries' trade with extra-ASEAN countries remain high, rather than diverting trade to within the region.

3.3.2. ASEAN's tariffs on its FTA partners

ASEAN has six external FTA partners, China, Korea, Japan, Australia, New Zealand and India, across five FTAs, as shown in Table 11. All six FTA partners are part of ASEAN's top 20 trading partners in 2015 and take up 38.1% of ASEAN's total trade (ASEAN Secretariat, 2016), with significant reductions and eliminations of tariffs across a majority of products as committed by partners in these agreements.

Besides these FTAs signed as a regional bloc, individual ASEAN countries are also active in negotiating and signing free trade agreements, especially Singapore, Malaysia, Thailand and Vietnam (Hill and Menon, 2010). This is not unexpected as these four countries have the highest trade

openness index among the ASEAN countries (Figure 4). The status of these individual trade agreements is shown in Table 12.

As such, both ASEAN as a regional bloc and its individual member states have various FTAs with low PRF tariffs, which are lower than MFN applied rates and comparable to that of AFTA. Figure 8 shows the weighted MFN and PRF tariff rates faced by imports from ASEAN and imports from its six FTA partners, calculated using equations (9) to (12). The PRF tariff faced by the six FTA partners is similar to the PRF tariff faced by intra-ASEAN partners. As a result, the small difference in the two PRF tariffs might be another reason why the tariff reduction in AFTA's CEPT did not thus lead to higher intra-regional trade, because the most important extra-regional partners are treated almost similarly to their intra-regional partners.

Table 11. ASEAN's FTAs

FTA	**Date of Signature**
ASEAN Free Trade Agreement	Jan 1992
ASEAN-China FTA (ACFTA)	Nov 2002
ASEAN-Korea FTA (AKFTA)	Aug 2006
ASEAN-Japan FTA (AJFTA)	Apr 2008
ASEAN-Australia-New Zealand FTA (AANZFTA)	Feb 2009
ASEAN-India FTA (AIFTA)	Aug 2009

Source: Ministry of International Trade and Industry of Malaysia (n.d.)

Table 12. Individual ASEAN member states' FTAs

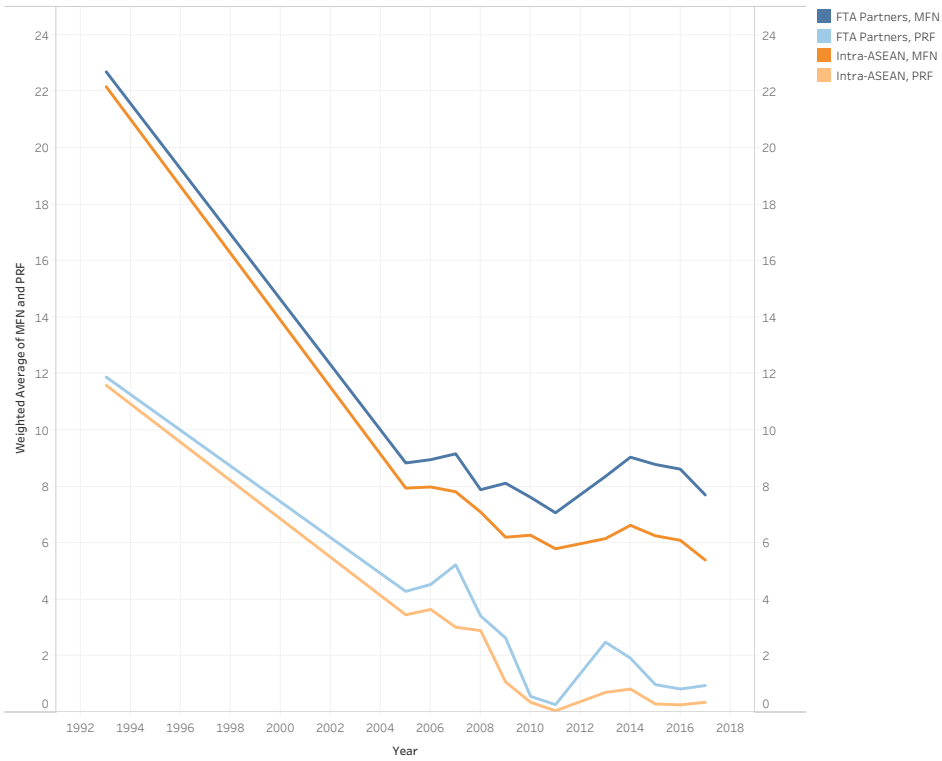
Country/Region	Under Implementation	Notified, but not yet in force	Early announcement made
ASEAN	6		
Brunei	1	1	
Indonesia	2		2
Laos	2		
Malaysia	8		2
Myanmar	2		
Philippines	3		1
Singapore	18		3
Thailand	7		2
Vietnam	6		2

Source: WTO (n.d.)

3.3.3. Discussion

This reduction in tariffs of both MFN applied tariffs and PRF tariffs for its FTA partners is not unexpected given ASEAN's need to trade with external partners. Menon (2018) argues that the similar treatment of fellow ASEAN members and extra-ASEAN trading partners is part of the broader effort to liberalize and promote globalization. Due to the more external-facing nature of ASEAN trade, the reduction of tariffs was applied not only to ASEAN member states, but also across trade with other countries.

Figure 8. Tariffs on Imports from ASEAN and its six FTA partners (%)



Source: UNCTAD TRAINS

Chapter 4. Conclusion

With the reduction of tariffs to between zero and five per cent levels under the AFTA's CEPT and the development of the ASEAN Economic Community, this paper seeks to analyse intra-ASEAN trade using two different approaches that exist in literature. The first approach, using the three intra-regional trade indicators available in literature, presented contradictory results with ASEAN having higher trade share values than Mercosur, but also higher values for trade intensity and regional introversion index than EU and NAFTA. Such contradictory results due to the different benchmarks used in each indicator suggest that trade indicators may not be a good way to determine the degree of intra-regional integration of ASEAN in comparison to EU, NAFTA and Mercosur.

As such, the second approach taken in this paper uses a gravity model, which presented clearer results. The statistically significant negative coefficient on the ASEAN dummy suggests that ASEAN has had a smaller impact on intra-ASEAN trade levels than the average FTA across the world, which had a positive and significant coefficient in the regression result. When compared against the coefficient for the EU dummy, the sum of EU and FTA dummies has a less negative result than that of ASEAN, suggesting that intra-ASEAN trade is indeed less integrated than intra-EU trade.

Two possible reasons for ASEAN's low level of trade integration were identified in this paper. Although the intra-ASEAN tariff rates had reduced over the years, both its MFN applied tariff rate as well as its preferential tariff rate on its six FTA partners had also reduced concurrently over the years. As such, there is less incentive for countries to trade within the region, rather than outside the region.

A limitation of this paper is that it takes a narrow view of regional integration, looking specifically at trade than other important economic aspects like the flows of investment, or political, social and cultural aspects, which are all elements of the larger push towards forming the ASEAN Community on the three pillars – Economic, Political-Security as well as Socio-Cultural.

Other possible factors that were not explored but could possibly hinder further trade integration in the ASEAN region include political and social concerns, especially given the historical animosities between countries like Malaysia and Indonesia, Malaysia and Singapore, Indonesia and Singapore as well as Indonesia and Philippines. Although the region is generally at peace, tensions from historical animosities may add suspicion in trade cooperation among these countries, thereby hindering further trade integration.

Nevertheless, ASEAN has come a long way since its formation, first serving more as a diplomatic platform for member states to address issues in a peaceful manner and now becoming a more integrated community, whether in terms of political-security, economic or socio-cultural aspects. There is still room to grow as an ASEAN Economic Community and further intra-ASEAN trade integration can be achieved.

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국문초록

아세안 역내 무역: 지표, 요인 및 시사점

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1992 년에 아세안 자유무역협정이 체결되었고, 아세안 회원국들은 관세를 낮추었으며, 이후 2007 년에는 아세안 경제공동체를 이루었다. 그러나 아세안의 정부 지도자들은 아세안의 역내 무역 점유율 지표를 통해 아세안 역내 무역이 여전히 높지는 않다고 발표했다.

따라서 본 연구는 EU, NAFTA, 그리고 Mercosur 등 다른 역내 기구에 비해 아세안의 역내 무역이 여전히 높지 않다는 주장에 관하여 세 가지 지표(무역 점유율, 역내 무역 집중도지수, 지역무역내향성지수)를 통해 분석하였다. 그런데 각 지표 분석은 서로 모순된 결과를 초래했다. 무역 점유율에 따르면, EU 와 NAFTA 가 아세안에서의 역내 무역보다 높게 나타났고 Mercosur 가 아세안에서의 역내 무역보다 낮았다. 반면 역내 무역 집중도지수 및 지역무역내향성지수에 따르면, EU 와 NAFTA 가 아세안에서의 역내 무역보다 낮게 나타났고 Mercosur 가 아세안에서의 역내 무역보다 높았다.

따라서 보다 정확한 연구 결과를 얻기 위해 중력 모형을 통해 분석하였다. 중력 모형을 분석 결과, EU 에 비해 아세안 역내 무역이 문헌에서와 같이 높지 않음을 확인할 수 있었다. 또한 NAFTA 와 Mercosur 는 통계적으로 유의미하지 않았다.

마지막으로 공동유효특혜관세(CEPT) 하에 '관세를 낮췄음에도 불구하고 왜 아세안 역내 무역이 높지 않았는가'에 대한 설명을 위해 관세 데이터를 사용하여 분석하였고, 본 연구에서는 두 가지 원인을 제시한다. 첫째, 최혜국 대상으로 적용한 관세가 낮아짐과 동시에 아세안 국가를 대상으로 특혜관세도 낮아졌다. 둘째, 아세안의 6 개의 FTA 회원국에 대한 특혜관세가 낮아졌다는

것이다. 사실상 이 두 특혜관세 사이의 차이는 거의 무시해도 되는 수준이다. 즉, FTA 회원국에 대한 최혜국 대상 관세 및 특혜관세가 동시에 감소했고, 따라서 역외 무역과 비교하여 아세안 역내 무역에서의 인센티브 또한 거의 없기 때문에 아세안 역내 무역이 높지 않다는 결론을 도출할 수 있었다.

주요어: 아세안 역내 무역, 역내 무여, 역내 기구, 아세안

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